Vet Call

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Recognize the danger heat poses to your herd

As we move into summer, it is important to recognize the danger high heat and humidity pose to cattle. Cattle are more sensitive to heat than humans. They reach their "critical" temperature (the temperature at which negative effects start to occur) when the temperature-humidity index reaches the high 80s.

Temperature, humidity and the amount of direct sunlight are the primary factors that determine an animal's body temperature. However, other factors — such as precipitation, wind, amount of night cooling and exposure to fescue endophyte — are important.

Precipitation can cause problems because high humidity reduces the ability of cattle to use evaporation to dissipate heat. Evaporative cooling occurs when sweat or moisture evaporates from the respiratory tract or skin. Evaporation is the primary means by which cattle cool themselves at temperatures higher than 70° F.

The effects of wind and nighttime temperatures are also important. If winds are calm or if cattle congregate behind a windbreak, the animals' ability to be cooled is reduced. Night temperatures that remain above 70° F increase the danger of heat stress because of little or no night cooling.

Cattle that are not acclimated to hot weather are also at greater risk if weather changes rapidly or if the cattle are moved to an environment with greater heat stress.

Cattle that have eaten endophyte-infected fescue may have increased body temperatures and may be predisposed to heat stress.

Another factor that plays a role in heat stress is hide color, with black-hided cattle at greater risk than cattle with light-colored hides. Breed plays a role in that *Bos indicus* breeds (Brahman and others) handle heat better than do *Bos taurus* (European) breeds.

For cattle in a feedlot situation, special attention should be given to newly arrived cattle and heavier cattle approaching finished weights. Iowa researchers found that unshaded lots facing south, southwest or west had higher death losses than lots facing east or southeast during a period of severe heat stress.

Effects on reproduction

In addition to its effect on health and production, heat stress also affects reproduction. Researchers in Missouri and Florida have shown that heat stress dramatically lowers conception rates, influences estrous behavior, modifies hormone function, alters the uterine environment, and delays or interrupts early embryo development in dairy cattle.

Heat stress occurring on the day of estrus or within one to seven days post-estrus is particularly damaging to embryo survival. In Florida research, the most significant decline in conception rates occurred during the months of June, July and August, and recovery was slow, requiring an additional two months before achieving pre-heat-stress rates.

Work with dairy cattle has shown that as environmental temperatures rise, an animal's attempt to regulate its temperature results in blood flow being redirected from the body core toward peripheral tissues for dissipation of excess body heat. Because of the redirection of blood flow from the uterus, cows that are in the last trimester of gestation during a period of heat stress will have less nutrient exchange between themselves and their fetuses during the period of greatest fetal growth. Therefore, calves that are born shortly after periods of heat (August and September for the Northern Hemisphere) are lighter at birth than calves born at other times of the year.

Managing periods of heat stress

Scientists in Nebraska and Kansas have outlined a number of management strategies to use during periods of heat stress. They point out that it is important to have ample water available. When temperatures reach 80° F, cattle need 2-3 gallons (gal.) of water per 100 pounds (lb.) of body weight. The flow rate should be able to accommodate 5-10 gal./animal/hour.

If cattle must be handled, work them from midnight to 8 a.m. Do not move or work cattle after 10 a.m. While it may make sense to work cattle after sundown, wait until the cattle have had at least six hours of night cooling before being worked.

Shades that are 10-12 feet tall and that provide 20-30 square feet or more per head have been shown to reduce heat stress and to increase feed intake, weight gain and performance. Even when air temperature is not reduced, shade reduces the heat gain resulting from solar radiation.

During periods of heat stress, cattle seek the coolest spots and are unwilling to leave these areas. Shades should be placed over feed and over areas where the producer wants the cattle to spend time. Shades should have a north-south orientation to allow drying under them as the shaded area moves throughout the day.

For cattle confined to a lot, sprinklers can be used to combat heat stress. In areas where humidity can be high, a large water droplet is required to wet the skin; fine mists or fog systems are not as effective in these areas.

Sprinklers reduce heat stress by increasing evaporative losses and by reducing ground temperature, radiant-heat gain and dust. Sprinkling should be intermittent; otherwise, high humidity may result, and there may be little opportunity for evaporation. A 1- to 2-minute shower followed by 20-30 minutes of drying and evaporation is common. Airflow can be enhanced in feedlots by providing mounds on which cattle can stand and by moving cattle away from windbreaks and wind dead spots.

Keep them cool

Heat stress is caused by a combination of environmental and animal factors that result in reduced performance as the animal attempts to cool itself. In extreme cases, death is possible. The main objective for cattle managers during periods of heat stress is to keep the cattle's body temperatures from climbing to dangerous levels.

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